AMENDMENTS TO THE CLAIMS

Please amend the claims as follows:

This listing of claims will replace all prior versions, and listing, of claims in the application:

Claim 1 (currently amended): An isolated or recombinant nucleic acid comprising a ~~sequence that encodes a polypeptide having alpha amylase activity, wherein said~~ sequence **[[is]]** selected from the group consisting of:

(a) a sequence encoding a polypeptide having alpha amylase activity, wherein the sequence has ~~having~~ at least 85% sequence identity to a sequence as set forth in SEQ ID NO:125, ~~as determined by analysis with a sequence comparison algorithm or by visual inspection~~;

(b) a sequence encoding a polypeptide having alpha amylase activity, wherein the sequence has at least 90% sequence identity to a sequence as set forth in SEQ ID NO:126; and

(c) **[[(b)]]** sequences complementary to (a) or (b).

Claim 2 (currently amended): An isolated or recombinant nucleic acid ~~encoding a polypeptide having alpha amylase activity~~ that hybridizes under stringent conditions to SEQ ID NO:125, wherein the nucleic acid comprises a sequence selected from the group consisting of:

(a) a sequence encoding a polypeptide having alpha amylase activity, wherein the sequence has ~~having~~ at least 85% sequence identity to a sequence as set forth in SEQ ID NO:125;

(b) a sequence encoding a polypeptide having alpha amylase activity, wherein the sequence has at least 90% sequence identity to a sequence as set forth in SEQ ID NO:126; and

(c) **[[(b)]]** sequences complementary to (a) or (b);

wherein the stringent conditions comprise a wash step comprising 30 minutes at room temperature in a solution comprising 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na2EDTA, 0.5% SDS, followed by a 30 minute wash in fresh solution at Tm-10°C~~, and wherein the sequence encodes a polypeptide having alpha amylase activity~~.

Claim 3 (currently amended): An isolated or recombinant nucleic acid encoding a polypeptide having alpha amylase activity that hybridizes under stringent conditions to a sequence selected from the group consisting of: (a) a sequence as set forth in SEQ ID NO:125; (b) a sequence encoding a polypeptide having a sequence as set forth in SEQ ID NO:126; and, (c) [[(b)]] sequences complementary to (a) or (b);

wherein the stringent conditions comprise a wash step comprising 30 minutes at room temperature in a solution comprising 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na_2EDTA, 0.5% SDS, followed by a 30 minute wash in fresh solution at Tm-10°C, and wherein the sequence encodes a polypeptide having alpha amylase activity.

Claim 4 (Previously presented): The isolated or recombinant nucleic acid of claim 2 or claim 3, wherein the Tm=81.5+16.6(log [Na+])+0.41(fraction G+C)-(0.63% formamide)-(600/N) where N is the length of the nucleic acid.

Claim 5 (Canceled)

Claim 6 (currently amended)): The isolated or recombinant nucleic acid of claim 1, wherein the sequence identity is determined ~~over the entire sequence~~ comprising use of a BLASTN or BLAST P program algorithm with default parameters.

Claim 7 (currently amended): The isolated or recombinant nucleic acid of claim 1 or claim 2, wherein the sequence has at least 95% [[90%]] sequence identity to SEQ ID NO:125 over a region of at least about 200~~, 300, 400 or 500~~ consecutive residues, or 90% sequence identity to SEQ ID NO:125 over a region of at least about 300, 400 or 500 consecutive residues.

Claim 8 (currently amended)): The isolated or recombinant nucleic acid of claim 1 or claim 2, wherein the polypeptide having alpha amylase activity has an amino acid sequence having [[has]] at least 99% [[95%]] sequence identity to SEQ ID NO:126 over a region of at least about 75 [[,]] or 100 [[, or 150]] consecutive residues.

Claim 9 (currently amended): The isolated or recombinant nucleic acid of claim 1 or claim 2, wherein the polypeptide having alpha amylase activity has an amino acid sequence [[has]] having at least 97% sequence identity to SEQ ID NO:126 over a region of at least about ~~50, 75, 100 or~~ 150 consecutive residues.

Claim 10 (currently amended): An isolated or recombinant nucleic acid comprising a sequence ~~that encodes a polypeptide having alpha amylase activity, wherein said sequence is~~ selected from the group consisting of: (a) a sequence encoding a polypeptide having alpha amylase activity comprising a sequence having at least 97% [[95%]] sequence identity to a sequence as set forth in SEQ ID NO:126 ~~SEQ ID NO:125~~ over a region of at least about ~~75, 100, or~~ 150 consecutive amino acid residues, as determined by analysis with a sequence comparison algorithm or by visual inspection; and (b) sequences complementary to (a).

Claim 11 (currently amended): An isolated or recombinant nucleic acid comprising a sequence ~~that encodes a polypeptide having alpha amylase activity, wherein the sequence is~~ selected from the group consisting of: (a) a sequence encoding a polypeptide having alpha amylase activity comprising a sequence having at least 99% [[97%]] sequence identity to a sequence as set forth in SEQ ID NO:126 ~~SEQ ID NO:125~~ over a region of at least about [[50,]] 75 [[,]] or 100 [[or 150]] consecutive amino acid residues, as determined by analysis with a sequence comparison algorithm or by visual inspection; and (b) sequences complementary to (a).

Claim 12 (currently amended): An isolated or recombinant nucleic acid comprising a sequence ~~that encodes a polypeptide having alpha amylase activity, wherein the sequence is~~ selected from the group consisting of: (a) a sequence having at least 90% sequence identity to a sequence as set forth in SEQ ID NO:125 over a region of at least about [[200,]] 300, 400 or 500 consecutive residues, as determined by analysis with a sequence comparison algorithm or by visual inspection, wherein the sequence encodes a polypeptide having alpha amylase activity; and (b) sequences complementary to (a).

Claim 13 (Canceled)

Claim 14 (Previously presented): The isolated or recombinant nucleic acid of claim 1, wherein the sequence identity is at least about 97%.

Claim 15 (Previously presented): The isolated or recombinant nucleic acid of claim 1, wherein the sequence identity is at least about 95%.

Claim 16 (Previously presented): The isolated or recombinant nucleic acid of claim 1, wherein the sequence comparison algorithm is FASTA version 3.0t78 with the default parameters.

Claim 17 (currently amended): A probe comprising a nucleic acid comprising at least 500 consecutive bases of a sequence as set forth in claim 1 or claim 2, wherein the probe can identify or isolate an amylase-encoding gene by hybridizing to the gene under stringent conditions comprising a wash step comprising a wash for 30 minutes at room temperature in a solution comprising 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na_2EDTA, 0.5% SDS, followed by a 30 minute wash in fresh solution.

Claims 18 to 46 (Canceled)

Claim 47 (currently amended): A method of producing a polypeptide having an amino acid sequence having at least about 90% [[75%]] sequence identity to a sequence as set forth in SEQ ID NO:126, ~~as determined by analysis with a sequence comparison algorithm or by visual inspection~~;

comprising the steps of introducing a nucleic acid encoding the polypeptide into a host cell under conditions that allow expression of the polypeptide, wherein the expressed polypeptide has alpha amylase activity.

Claim 48 (Previously presented): A method of producing a polypeptide having amylase activity, comprising the steps of: providing a nucleic acid having a sequence as set forth in claim 1, 10 or 12; introducing the nucleic acid encoding the polypeptide, operably linked to a promoter, into a host cell under conditions that allow expression of the polypeptide.

Claims 49 to 73 (Canceled)

Claim 74 (withdrawn): An assay for identifying a polypeptide having amylase activity comprising the steps of:

(a) providing a nucleic acid as set forth in claim 1, 10 or 12;

(b) expressing the nucleic acid to provide a polypeptide;

(c) contacting the polypeptide, with a substrate molecule under conditions which allow the polypeptide to function; and

(d) detecting either a decrease in an amount of a substrate or an increase in an amount of a reaction product which results from a reaction between said polypeptide and said substrate; wherein a decrease in the amount of the substrate or an increase in the amount of the reaction product is indicative of existence of the functional polypeptide.

Claim 75 (currently amended): A nucleic acid probe <u>for identifying or isolating an amylase-encoding gene, wherein the probe comprises</u> ~~comprising~~ an oligonucleotide at least about 50 nucleotides in length and having a segment of at least 50 contiguous nucleotides of a nucleic acid target region having sequence as set forth in claim <u>1 or claim 2</u> [[10]]; and which hybridizes under stringent conditions to the nucleic acid target region to form a detectable target:probe duplex, wherein the nucleic acid target encodes a polypeptide having alpha amylase activity and the stringent hybridization conditions comprise a wash step comprising a wash for 30 minutes at room temperature in a solution comprising 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na_2EDTA, 0.5% SDS, followed by a 30 minute wash in fresh solution.

Claim 76 (Previously presented): The nucleic acid probe of claim 75, wherein the oligonucleotide comprises DNA or RNA.

Claim 77 (Previously presented): The nucleic acid probe of claim 75, wherein the oligonucleotide has at least 98% sequence identity to the nucleic acid target region.

Claim 78 (currently amended): The nucleic acid probe of claim 77, wherein the oligonucleotide has at least 75, 100 **[[,]]** or 150 contiguous nucleotides having at least 96% sequence identity to the nucleic acid target region or 200 contiguous nucleotides having at least 95% sequence identity to the nucleic acid target region.

Claim 79 (Previously presented): The nucleic acid probe of claim 78, wherein the oligonucleotide has at least 97% sequence identity to the nucleic acid target region.

Claim 80 (currently amended): The nucleic acid probe of claim 75, wherein the oligonucleotide has at least **[[**200,**]]** 300, 400 or 500 contiguous nucleotides having at least 90% sequence identity to the nucleic acid target region.

Claims 81 to 83 (Canceled)

Claim 84 (Previously presented): The nucleic acid probe of claim 75, wherein the oligonucleotide has at least 150 contiguous nucleotides having sequence identity to the nucleic acid target region.

Claim 85 (Previously presented): The nucleic acid probe of claim 75, wherein the oligonucleotide has at least 200 contiguous nucleotides having sequence identity to the nucleic acid target region.

Claim 86 (Previously presented): The nucleic acid probe of claim 75, wherein the oligonucleotide has a segment that is fully complementary to the nucleic acid target region.

Claim 87 (Canceled)

Claim 88 (Original): The nucleic acid probe of claim 75, wherein the probe further comprises a detectable isotopic label.

Claim 89 (Original): The nucleic acid probe of claim 75, wherein the probe further comprises a detectable non-isotopic label selected from the group consisting of a fluorescent molecule, a chemiluminescent molecule, an enzyme, a cofactor, an enzyme substrate, and a hapten.

Claim 90 to 91 (Canceled)

Claim 92 (Previously presented): The nucleic acid probe of claim 75, wherein the stringent conditions comprise a wash step comprising 30 minutes at room temperature in a solution comprising 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na2EDTA, 0.5% SDS, followed by a 30 minute wash in fresh solution at Tm-10°C.

Claim 93 (Previously presented): A polynucleotide probe for isolation or identification of alpha amylase genes having a sequence which is the same as, or fully complementary to at least a 50 nucleotide residue fragment of SEQ ID NO:125.

Claims 94 to 101 (Canceled)

Claim 102 (Previously presented): A cloning vector comprising a sequence that encodes a polypeptide having alpha amylase activity, said sequence comprising a sequence as set forth in claim 1, 10 or 12.

Claim 103 (Previously presented): A host cell comprising a nucleic acid having a sequence that encodes a polypeptide having alpha amylase activity, said sequence comprising a sequence as set forth in claim 1, 10 or 12.

Claim 104 (Previously presented): An expression vector capable of replicating in a host cell comprising a polynucleotide having a sequence as set forth in claim 1, 10 or 12.

Claim 105 (Previously presented): A vector as claimed in claim 102, wherein the vector is selected from the group consisting of viral vectors, plasmid vectors, phage vectors, phagemid vectors, cosmids, fosmids, bacteriophages, artificial chromosomes, adenovirus vectors, retroviral vectors, and adeno-associated viral vectors.

Claim 106 (Previously presented): A host cell comprising an expression vector as claimed in claim 104.

Claim 107 (Previously presented): A host cell as claimed in claim 103, wherein the host is selected from the group consisting of prokaryotes, eukaryotes, funguses, yeasts, and plants.

Claim 108 (withdrawn): A method for liquifying a starch containing composition comprising contacting the starch with a polypeptide encoded by a nucleic acid comprising a sequence as set forth in claim 1, 10 or 12.

Claims 109 to 111 (Canceled)

Claim 112 (withdrawn): A method for washing an object comprising contacting said object with a polypeptide encoded by a nucleic acid comprising a sequence as set forth in claim 1, 10 or 12, under conditions sufficient for said washing.

Claim 113 (withdrawn): A method for textile desizing comprising contacting said textile with a polypeptide encoded by a nucleic acid comprising a sequence as set forth in claim 1, 10 or 12, under conditions sufficient for said desizing.

Claim 114 (withdrawn): A method for the treatment of lignocellulosic fibers, wherein the fibers are treated with a polypeptide encoded by a nucleic acid comprising a sequence as set forth in claim 1, 10 or 12, in an amount which is efficient for improving the fiber properties.

Claim 115 (withdrawn): A method according to claim 113 for enzymatic deinking of recycled paper pulp, wherein the polypeptide encoded by a nucleic acid comprising a sequence as set forth in claim 1, 10 or 12 is applied in an amount which is efficient for effective deinking of the fiber surface.

Claim 116 (withdrawn): A method for starch liquefaction comprising contacting said starch with a polypeptide encoded by a nucleic acid comprising a sequence as set forth in claim 1, 10 or 12 under conditions sufficient for said liquefaction.

Claim 117 (Canceled)

Claim 118 (withdrawn): A method for producing a high-maltose or a high-glucose syrup or a mixed syrup comprising:

liquefying starch using an effective amount of a polypeptide encoded by a nucleic acid comprising a sequence as set forth in claim 1, 10 or 12 to obtain a soluble starch hydrolysate; and

saccharifying the soluble starch hydrolysate, thereby resulting in a syrup.

Claim 119 (withdrawn): The method as in any of claims 108, wherein the starch is from a material selected from rice, germinated rice, corn, barley, wheat, legumes and sweet potato.

Claim 120 (withdrawn): The method as in any of claims 108, further comprising addition of a second alpha amylase or a beta amylase or a combination thereof.

Claim 121 (withdrawn): A method of increasing the flow of production fluids from a subterranean formation by removing a viscous, starch-containing, damaging fluid formed during production operations and found within the subterranean formation which surrounds a completed well bore comprising:

allowing production fluids to flow from the well bore;

reducing the flow of production fluids from the formation below expected flow rates;

formulating an enzyme treatment by blending together an aqueous fluid and a polypeptide encoded by a nucleic acid comprising a sequence as set forth in claim 1, 10 or 12;

pumping the enzyme treatment to a desired location within the well bore;

allowing the enzyme treatment to degrade the viscous, starch-containing, damaging fluid, whereby the fluid can be removed from the subterranean formation to the well surface; and

wherein the enzyme treatment is effective to attack the alpha glucosidic linkages in the starch-containing fluid.

Claim 122 (Previously presented): The method of claim 47, wherein the amino acid sequence has at least 97% sequence identity over a region of at least about 150 consecutive residues.

Claim 123 (currently amended): The method of claim 47, wherein the amino acid sequence has at least 99% [[98%]] sequence identity over a region of at least about 75, 100 or 150 consecutive residues.

Claim 124 (currently amended): The method of claim 47, wherein the sequence identity is determined ~~over the entire sequence~~ comprising use of a BLASTN or BLAST P algorithm with default parameters.

Claim 125 (new): The isolated or recombinant nucleic acid of claim 1 or claim 2, wherein the polypeptide having alpha amylase activity has a sequence having at least 96% sequence identity to SEQ ID NO:125 over a region of at least about 150 consecutive nucleotides.

Claim 126 (new): The isolated or recombinant nucleic acid of claim 2, wherein the sequence encoding the polypeptide has at least 98% sequence identity to SEQ ID NO:126 over a region of at least about 150 consecutive amino acid residues.

Claim 127 (new): The isolated or recombinant nucleic acid of claim 126, wherein the sequence encoding the polypeptide has at least 99% sequence identity to SEQ ID NO:126 over a region of at least about 150 consecutive amino acid residues.

Claim 128 (new): A probe comprising a nucleic acid having at least 85% sequence identity to SEQ ID NO:125, wherein the probe can identify or isolate an amylase-encoding gene by hybridizing to the gene under stringent conditions comprising a wash step comprising a wash for 30 minutes at room temperature in a solution comprising 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na_2EDTA, 0.5% SDS, followed by a 30 minute wash in fresh solution.

Claim 129 (new): A probe comprising a nucleic acid having at least 95% sequence identity over 200 consecutive nucleotides of SEQ ID NO:125, wherein the probe can identify or isolate an amylase-encoding gene by hybridizing to the gene under stringent conditions comprising a wash step comprising a wash for 30 minutes at room temperature in a solution comprising 150 mM NaCl, 20 mM Tris hydrochloride, pH 7.8, 1 mM Na_2EDTA, 0.5% SDS, followed by a 30 minute wash in fresh solution.

Claim 130 (new): A method of producing a polypeptide encoded by a nucleic acid having at least 85% sequence identity to SEQ ID NO:125, comprising the steps of introducing a nucleic acid encoding the polypeptide into a host cell under conditions that allow expression of the polypeptide, wherein the expressed polypeptide has alpha amylase activity.

Claim 131 (new): A method of producing a polypeptide encoded by a nucleic acid having at least 90% identity over 300 to 500 nucleotides of SEQ ID NO:125, comprising the steps of introducing a nucleic acid encoding the polypeptide into a host cell under conditions that allow expression of the polypeptide, wherein the expressed polypeptide has alpha amylase activity.

Claim 132 (new): A method of producing a polypeptide encoded by a nucleic acid having at least 96% identity over 75 to 100 nucleotides of SEQ ID NO:125, comprising the steps of introducing a nucleic acid encoding the polypeptide into a host cell under conditions that allow expression of the polypeptide, wherein the expressed polypeptide has alpha amylase activity.

Claim 133 (new): A method of producing a polypeptide encoded by a nucleic acid having at least 98% identity over 50 nucleotides of SEQ ID NO:125, comprising the steps of introducing a nucleic acid encoding the polypeptide into a host cell under conditions that allow expression of the polypeptide, wherein the expressed polypeptide has alpha amylase activity.

Claim 134 (new): The isolated or recombinant nucleic acid of claim 1, wherein the sequence identity is at least about 98%.

Claim 135 (new): The isolated or recombinant nucleic acid of claim 1, wherein the sequence identity is at least about 99%.